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**Economic and Social Commission for Western Asia (ESCWA)**

## **REPORT**

### **EXPERT GROUP MEETING ON HARNESSING TECHNOLOGY FOR ENHANCED SMALL AND MEDIUM-SIZED ENTERPRISES PRODUCTIVITY AND COMPETITIVENESS CAIRO, 3-4 NOVEMBER 2007**

#### **Summary**

The Expert Group Meeting on Harnessing Technology for Enhanced Small and Medium-sized Enterprises Productivity and Competitiveness (Cairo, 3-4 November 2007) assembled member country representatives of ministries and the private sector and experts from international and regional organizations to discuss institutional, legal, financial and policy frameworks to overcome market failures and barriers impeding technology deployment among small and medium-sized enterprises (SMEs).

The Meeting also provided a forum for exchanging country experiences in terms of national policies and regional and national initiatives being undertaken in the ESCWA region to support SMEs. While SME policies and programmes are being introduced, not all countries have incorporated a technology component into their SME support initiatives. Models for improving the ability of SMEs to integrate technology were discussed, including approaches related to adoption, innovation, customization and outsourcing arrangements. Technology tools that can enhance SME productivity at all stages of the product development process were reviewed, and how increasing awareness and compliance with technical standards can help SMEs to deploy technologies for enhancing their product lines and production processes was debated.

The participants agreed upon a set of recommendations addressed to ESCWA Governments, the private sector, academic institutions and business development support service providers, stressing that the interlinked priorities and actions of those key players should be aligned to yield a supportive enabling environment for SMEs to harness technology for improved productivity and competitiveness.

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## Introduction

1. The Economic and Social Commission for Western Asia (ESCWA), in partnership with the Arab Science and Technology Foundation (ASTF), organized the Expert Group Meeting on Harnessing Technology for Enhanced Small and Medium-sized Enterprises Productivity and Competitiveness in Cairo from 3 to 4 November 2007. The Meeting was held concurrently and in complementarity with the Made in the Arab World Competition finals, organized by ASTF at the same venue.

2. The main objectives of the Meeting are set forth below:

(a) To discuss institutional, legal, financial and policy frameworks to overcome market failures and barriers associated with technology deployment among small and medium-sized enterprises (SMEs);

(b) To share country experiences in terms of national policies and initiatives being undertaken to support technology development among SMEs;

(c) To examine regional initiatives addressing technology promotion among SMEs;

(d) To explore mechanisms and models for improving the ability of SMEs to integrate into global markets through the use of new technologies in key sectors;

(e) To discuss standards as instruments for motivating innovation and adaptation of technology;

(f) To outline successful technology tools for improving SME productivity at all stages of the production process.

3. The Meeting was held during six sessions, each devoted to a specific topic for discussion. Chapter I of this *Report* highlights the main conclusions and recommendations of the Meeting, while chapter II provides a summary of the discussions within each session. Full documentation of the Meeting is available at: <http://www.escwa.un.org/information/meetingdetails.asp?referenceNum=406E>.

## I. CONCLUSIONS AND RECOMMENDATIONS

4. Participants stressed that enhancing the competitiveness of SMEs in the ESCWA region depended largely on the priorities and actions taken by four key players, namely: Governments and public research centres, academic and technical institutions that provide vocational training, business development support service providers and SMEs. It was noted that complementarity and harmony in the development strategies being pursued by those key players would ensure a winning scenario for enhancing SME competitiveness and productivity in the region.

5. The following subsections list the main conclusions and recommendations relative to each of the above-mentioned key players.

### A. GOVERNMENT

6. It was pointed out that, while not all SME policies and programmes in the ESCWA member countries had incorporated a technology component, there was a clear role for Governments in creating an enabling environment for SMEs to harness technology and improve competitiveness, namely, through developing legislation and allocating sufficient financial and human resources to academic and technical institutions.

7. It was agreed that the policymaking process should involve all concerned government programmes, as well as the private sector; and that appropriate indicators should be deployed for guidance. It was also agreed to forego standardizing the definition of SME, the reason being that varying parameters might be used to best suit a specific policy objective. Furthermore, participants stressed that projects targeting SME development required proper scale and longevity to ensure effective policy implementation.

8. The following recommendations were issued and presented for consideration by the Governments of ESCWA member countries:

- (a) To formulate and continuously update an SME strategy based on international best practices;
- (b) To formulate and ratify laws governing intellectual property rights or, if such laws are already in existence, to ensure that enforcement is appropriately applied and serves as an effective deterrent against violation;
- (c) To formulate and enforce fair competition and anti-corruption laws;
- (d) To offer financial incentives, including tax breaks, simplified registration and licensing procedures and subsidized loans for equipment, to encourage start-up ventures and assist SME owners in modernizing production facilities. Support mechanisms should aim to reduce cost of money for SMEs and be based on performance, rather than across-the-board subsidies;
- (e) To allocate a minimum of 1 per cent of the national gross domestic product (GDP) over a five-year period to academic and research institutions for research and development programmes in areas targeted in national science and technology policies;
- (f) To promote regional collaboration in developing and implementing national science and technology policies to encourage research and development of technological solutions to overcome shared socio-economic problems facing the region;
- (g) To develop standards as a way to helping SMEs meet quality requirements and improve production processes;
- (h) To develop and conduct awareness-raising programmes tailored for SMEs on, for example, intellectual property rights and new technology tools.

#### B. SMALL AND MEDIUM-SIZED ENTERPRISES

9. It was pointed out that the dynamic and flexible structure of SMEs can facilitate adaptation to new market developments and technologies in production and process systems, provided sufficient information, knowledge and financing are made available to encourage such change. In view of their limited resources, SMEs should foster creative partnerships with firms along a value chain as a means for accessing networks of knowledge and technology that service upstream and downstream industries. According to participants, opportunities exist for SMEs in the region in such fields as services, including information technology, repair and maintenance, and product development and design.

10. The following recommendations were issued and presented for consideration by SMEs:

- (a) To seek creative business linkages with suppliers and clients, especially those active in global value chains, in order to benefit from networks and opportunities presented by outsourcing and subcontracting arrangements;
- (b) To stay informed about the latest technologies in related fields and core business functions, and to selectively adopt and adapt new technologies as required in accordance with a clearly developed business plan;
- (c) To outsource non-essential business services to dedicated providers with experience and know-how in emerging technologies, and building long-term partnerships with such providers in order to stay up to date and benefit from the latest technological developments;

(d) To fight negative market perceptions by adopting international standards and quality assurance technologies that ensure that the design, management and manufacture of goods meet consumer specifications and needs;

(e) To adopt and implement open, dynamic and flexible systems to accommodate technology changes in order to meet demand and comply with increasingly stringent international standards;

(f) To develop and implement strategies to attract and retain qualified and experienced technical staff, especially engineers and technicians involved in product development, and to promote training and re-training;

(g) To develop a culture that promotes innovation and risk taking, and to provide incentives to encourage employees to contribute to improved product quality and production efficiency;

(h) To apply total quality management principles and reverse engineering and value engineering techniques in product and process development;

(i) To partake in government policy-setting processes through lobbying groups and consultative processes.

#### C. ACADEMIC AND TECHNICAL INSTITUTIONS

11. Participants stressed the need for a wider role to be played by academic and technical institutions in supporting SMEs in the ESCWA region. Academic institutions were urged to respond to SME needs in terms of research and development and technical assistance, and to partner with technology providers in order to introduce new and emerging technologies in academic programmes to their students, who represent the future workforce for SMEs.

12. The following recommendations were issued for consideration by academic and technical institutions:

(a) To promote enrolment in science, technology and vocational training programmes which correspond to the needs of local industries;

(b) To establish partnerships with technology suppliers and providers of technical training for joint programmes and training sessions for SME owners and staff;

(c) To identify niche areas for research and become local centres of excellence in order to support and encourage research and development to meet the specific technology needs of local SMEs;

(d) To invite SMEs to provide input regarding the orientation of academic programmes in order for students to acquire the knowledge and skills required;

(e) To seek accreditation and continuously update curricula in order to encourage the integration of entrepreneurship and the spirit of innovation throughout the entire education system;

(f) To establish accredited laboratories within institutions to facilitate access to services for SMEs.

#### D. BUSINESS DEVELOPMENT SUPPORT SERVICE PROVIDERS

13. Business development support service providers were identified as non-governmental and private sector institutions that contribute to the creation of an enabling environment for SMEs. They are national, regional and international organizations, including those affiliated with the United Nations and civil society institutions.

14. The following recommendations were issued and presented for consideration by business development support service providers:

(a) To facilitate dissemination of information, particularly fostering linkages between SMEs, and diffusing knowledge on available technologies and innovations using such mechanisms as online tools, portals and virtual clinics;

(b) To develop business development networks to help diffusing services to SMEs;

(c) To take part in SME-related government policy design processes;

(d) To develop certification schemes to help SMEs meeting set standards;

(e) To foster linkages between SMEs, system integrators and technology suppliers;

(f) To develop research and development competition programmes in strategic areas of importance, for example water and energy, and promoting social responsibility initiatives in the region.

## **II. MAIN TOPICS OF DISCUSSION**

### **A. THE REGIONAL CONTEXT AND ESCWA MEMBER COUNTRY EXPERIENCES**

15. The keynote presentation gave an overview of SMEs in the ESCWA region, highlighting their importance and the challenges they face, both globally and regionally, while noting that the technological sophistication of output and export was below that of most other regions, including other developing regions. Faced with such challenges, SMEs could raise their productivity, either by lowering production costs or by improving production efficiency and management. Applying suitable technologies would generate additional productivity gains and improve performance in both those areas.

16. Discussion then concentrated on the varying definitions of SME used among ESCWA member countries, and on the elements of an enabling environment for assisting SMEs to harness technology, including the need for skilled human resources, relevant research and development, partnership with financing mechanisms catering to SME needs and strengthened legal framework. The presentation showed that a number of gaps were present in the ESCWA region in terms of such elements, and that the various key players, including Government, the private sector and the education system, have a major role to play in improving the environment and the technology deployment for SMEs. Ideally, efforts exerted by those players should be coordinated and interlinked with assistance programmes to achieve optimal results in increasing SME productivity and competitiveness.

17. Numerous SME development programmes exist in the ESCWA region. Delegated representatives of nine ESCWA member countries provided an overview of the national policies and initiatives being undertaken by their Governments to support SMEs, particularly in the area of technology deployment. The presentations are summarized below:

(a) In Bahrain, the SME Statement of Policy developed by the Ministry of Industry and Commerce seeks to increase SME output, employment and export by creating an enabling and business-friendly environment to challenge global competition, notably by reducing red tape. Technology access and upgrade are among the main issues targeted by the SME policy, specifically aiming to increase the use of information and communications technology (ICT) among SMEs;

(b) In Egypt, the Ministry of Finance assists SMEs through four components: policy, research, capacity-building and networking. In addition to legal and financial measures, innovation and technology are among the issues included in the national SME policy. An industrial modernization programme is one of the ways in which the Government provides technical assistance to facilitate technological upgrading among SMEs;

(c) In Jordan, the Ministry of Industry and Trade has developed an industrial law to support national industries, including small enterprises, through customs exemptions and other incentives, and through the establishing of industrial zones and specialized funds for private industry;

(d) In Lebanon, SME support measures adopted by the Ministry of Economy and Trade provide business support services through business development centres, through financial support, including innovative financing schemes, and through the formulation of a long-term SME strategy seeking to enhance competitiveness;

(e) In Oman, a dedicated directorate for SME development was recently established at the Ministry of Commerce and Industry to formulate a comprehensive SME strategy, as well as to support programmes and related legislation;

(f) In Palestine, a programme for upgrading industries has been developed, focusing on improving product quality and design, technology use and staff training;

(g) In the Syrian Arab Republic, the Euro-Mediterranean Charter for Enterprise, adopted in 2004, has instituted a framework for developing government policies for improving enterprise competitiveness and private sector development;

(h) In the United Arab Emirates, the Mohammed bin Rashid Establishment for Young Business Leaders in Dubai is one example of initiatives undertaken in the country to help establish new SMEs and support existing ones through entrepreneurial training, consulting and financing services;

(i) In Yemen, the Ministry of Industry and Trade and the Social Fund for Development, with aid from international and regional organizations, have initiated a number of projects for assisting SMEs, notably through microfinancing mechanisms, but also through the provision of such non-financial services as training and technical assistance.

## B. REGIONAL INITIATIVES

18. The planned establishment of the ESCWA Technology Centre (ETC) was discussed, specifically in relation to proposed objectives, anticipated major activities, budget and establishment timeline. It was highlighted that science and technology policy formulation, technology transfer and innovation management would constitute the main categories of activities of the Centre. As such, ETC would strive to disseminate information on modern technologies with strategic value for the region, while fostering synergy and complementarity in their application.

19. Regional technology initiatives supported by ASTF were also discussed, namely, Investing in Technology, which aims to increase the number of Arab technology start-ups with worldwide market potential and global competitive advantage. Outcomes are presented at the annual Investing in Technology Forum, a networking event attracting businesses, venture capital and other fund providers, technology providers and business incubators. Other complementary ASTF activities include the Made in the Arab World Competition and the Arab Technology Business Plan Competition.

## C. POLICY FRAMEWORKS FOR HELPING SMES TO HARNESS TECHNOLOGY

20. Examples of national and regional science and technology policy frameworks targeting SME development were discussed, with emphasis on their technology component. The Jordanian national science and technology policy, developed by the Higher Council for Science and Technology (HCST) in 1995, includes four components, namely, information, human resources development, technology transfer and research and development. Other SME initiatives supported by HCST include the annual Jordan Science Week and El-Hassan bin Talal Award for Scientific Excellence, as well as a fund for research and development in industry.

21. The National Fund for Enterprise Support (NAFES) was established in Jordan with support from the Japan International Cooperation Agency. NAFES is financially independent and relies on local expertise to provide management and entrepreneurial training and technical assistance to SMEs, thus ensuring continuity of benefit. Priority is given to enterprises and start-ups based outside Amman, and to SMEs directed by women.

22. The EuroMed Innovation and Technology Programme, also called Medibtikar, is a regional programme, funded by the European Commission, which targets the establishing of public and private intermediary organizations concerned with increasing SME competitiveness, for example technology parks and incubators, and the upgrading and improvement of existing facilities. Activities undertaken include training sessions, studies, technology transfer promotion, networking and technical assistance for specific sectors facing common challenges, for example food production and textile manufacturing.

23. Investment Promotion Units (IPUs), established by the United Nations Industrial Development Organization (UNIDO), operate in four Arab countries as one-stop shops for providing various business development services to industrial enterprises. The IPU in Egypt supports SMEs through the following two components: (a) technical assistance to SMEs directly, and to national SME development institutions; and (b) financial assistance to enterprises in the form of soft loans supported by the Italian Government.

24. The Arab Regional Centre for Entrepreneurship and Investment Training (ARCEIT) is also supported by UNIDO, by the Government of Bahrain, the host country, and by the Inter-Regional Centre for Entrepreneurship and Investment Training, a development institute funded by UNIDO and the Government of India. ARCEIT collaborates with a network of partner institutions and offers SME support services based on an entrepreneurship development model involving the following steps: (a) collective capacity-building programmes; (b) counselling and technology tie-up for potential joint ventures; (c) financial linkages; and (d) incubation.

#### D. MECHANISMS FOR STRENGTHENING SME COMPETITIVENESS THROUGH TECHNOLOGY LINKAGES

25. The different requirements that SMEs need to satisfy to achieve competitiveness in today's globalized markets were outlined. The use of technology throughout the stages of production, namely, input, transformation, output and end-of-life, can help SMEs meet many of those challenges. As such, the incorporation of technology has become a prerequisite for value added production and the entry into more stable and reliable value chains. Technology incorporation may be achieved through one, or a combination of several business models, including importing turnkey solutions, fostering home-grown innovation and developing customized solutions, as well as outsourcing and subcontracting. Each of those models has its own advantages and disadvantages, with the choice of approach dependent on the situation of the individual SME.

26. A presentation by a private sector firm provided a true account of how a combination of the above-mentioned business models had been used to harness renewable energy technologies for the production of energy and heating systems for housing purposes. The company succeeded at both the national and global scales by adopting a value engineering/value chain analysis paradigm involving the use of imported equipment, and customizing it with home-grown patented technology to deliver products that were compliant with international standards and responsive to consumer needs.

#### E. STANDARDS AS INSTRUMENTS FOR MOTIVATING INNOVATION AND ADAPTATION

27. Discussions focused on the issue of compliance with technical standards, including quality, safety and environmental management standards; and how such compliance can help SMEs increase customer satisfaction in local and export markets and facilitate their integration into international production chains. The many challenges facing SMEs to meeting those targets include lack of resources and technical knowledge, which can make compliance with standards an expensive endeavour. The presentation concluded by stressing the need for external support and favourable Government and business environment to facilitate access to information about standards and reduce the cost of compliance and testing.



28. Certification and product marking as ways of officially confirming compliance with a standard were also discussed. A representative of an accredited certification body explained how product testing and impromptu factory inspections were undertaken to protect credibility and control the use of their certified label. The certification process and associated monitoring requirements are usually beneficial for the enterprise, as they help the company identify problems and find ways to improve product quality and production processes.

#### F. TECHNOLOGY TOOLS FOR IMPROVING SME PRODUCTIVITY

29. During this session, a number of technology tools were illustrated which can be applied by SMEs to improve product design and development. To foster an effective environment for achieving prompt delivery of quality products at low cost, tools should be applied within a formal, cross-functional product development process which is based on a clear identification of customer needs, and supported by a company culture that encourages creativity, teamwork and entrepreneurial spirit.

30. Presentations by two multinational technology providers illustrated the active role technology suppliers can play in promoting awareness and the adaptation of generic quality assurance and process control technologies by SMEs in various industrial and service sectors. Since technology providers may not have intimate product and process knowledge, benefits may be further enhanced if the expertise of local system integrators is employed, for example business and technology experts attached to academic and technical institutions. Technology providers also have an important role to play in linking with and upgrading vocational training centres and engineering schools, leading to better training and qualification of students, who represent the future workforce, which, in turn, will benefit the industry as a whole.

31. Finally, a presentation by the Egypt National Cleaner Production Centre highlighted the role of the Centre in promoting clean production through certification, environmentally-sound technology transfer, chemical leasing programmes, waste valorization and training programmes. Numerous success stories of pollution abatement and environmental management pilot projects implemented in industrial enterprises operating in different sectors in Egypt were also outlined.

### III. ORGANIZATION OF WORK

#### A. VENUE AND DATE

32. The Expert Group Meeting on Harnessing Technology for Enhanced Small and Medium-sized Enterprises Productivity and Competitiveness was held at the J. W. Marriott Hotel in Cairo on 3 and 4 November 2007.

#### B. OPENING

33. The Meeting was formally opened by Ms. Anhar Hegazi, Director of the Sustainable Development and Productivity Division at ESCWA, who presented the opening statement on behalf of Mr. Bader al-Dafa, Executive Secretary of ESCWA, and by Mr. Abdalla Alnajjar, President of ASTF. Opening addresses were also delivered by Mr. Mohamed bin Youssef, Director General of the Arab Industrial Development and Mining Organization (AIDMO), and by Mr. Ahmed Nassar, Acting Director General for the Planning and Monitoring Group of the Social Fund for Development of Egypt, on behalf of Mr. Hany Seif el Nasr, Managing Director of the Social Fund for Development of Egypt.

#### C. PARTICIPANTS

34. The Meeting was attended by 52 participants, including Government representatives from ministries responsible for SME policymaking and development from nine ESCWA member countries. In addition, experts in the fields of SME development, entrepreneurship, innovation and technology from regional and international organizations, as well as private sector representatives, gave presentations and participated in discussions. Through ASTF, contestants in the Made in the Arab World Competition finals also attended the

Meeting, allowing for an exchange of ideas with participants. The list of participants is contained in the annex of this *Report*.

#### D. AGENDA

35. Presentations and discussions were made over six sessions. The agenda of the Meeting is summarized and set forth below:

1. Opening.
2. Regional overview and ESCWA member country presentations by delegated Government representatives.
3. Presentation and discussion on regional initiatives.
4. Presentation and discussion on policy frameworks for helping SMEs to harness technology.
5. Presentation and discussion on mechanisms for strengthening SME competitiveness through technology linkages.
6. Presentation and discussion on standards as instruments for motivating innovation and adaptation.
7. Presentation and discussion on technology tools for improving SME productivity.
8. Discussion and closing session.

#### E. EVALUATION

36. An evaluation questionnaire was distributed in order to assess the relevance, effectiveness and impact of the Meeting. In general, feedback was positive and all respondents to the questionnaire rated the overall quality, usefulness and organization of the Meeting to be good or excellent, noting it had met their expectations. Several respondents also indicated that they would like follow-up activities, namely, hands-on workshops on the use of some of the technology tools introduced, and further meetings with the focus on specific recommendations.

#### F. DOCUMENTS

37. The list of documents submitted to the Meeting is available on the ESCWA website at: <http://www.escwa.un.org/information/meetingdetails.asp?referenceNum=406E>.

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